



Mild heat treatment does not reduce the colitis-protective effects of bovine colostrum in preterm pigs

Støy, Ann Cathrine Findal; Sangild, Per Torp; Skovgaard, Kerstin; Thymann, Thomas; Bjerre, Mette; Chatterton, Dereck Edward Winston; Purup, Stig; Boye, Mette; Schmidt, Mette; Heegaard, Peter M. H.

Publication date:
2013

[Link back to DTU Orbit](#)

Citation (APA):

Støy, A. C. F., Sangild, P. T., Skovgaard, K., Thymann, T., Bjerre, M., Chatterton, D. E. W., Purup, S., Boye, M., Schmidt, M., & Heegaard, P. M. H. (2013). *Mild heat treatment does not reduce the colitis-protective effects of bovine colostrum in preterm pigs*. Abstract from 46th Annual Meeting of the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN 2013), London, United Kingdom.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Mild heat treatment does not reduce the colitis-protective effects of bovine colostrum in preterm pigs

Ann Cathrine F. Støy¹, Per T. Sangild², Kerstin Skovgaard¹, Thomas Thymann², Mette Bjerre³, Dereck E.W. Chatterton⁴, Stig Purup⁵, Mette Boye¹, Mette Schmidt⁶, Peter M. H. Heegaard¹

¹Innate Immunology Group, National Veterinary Institute, Technical University of Denmark, Bülowsvej 27, DK-1870 Frederiksberg C, Denmark

²Department of Human Nutrition, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark

³The Medical Research Laboratories, Department of Clinical Medicine, Faculty of Health Sciences, Aarhus University, DK-8000 Aarhus C, Denmark

⁴Department of Food Science, Dairy Technology, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark

⁵Department of Animal Science, Aarhus University, Blichers Allé 20, DK-8830 Tjele, Denmark

⁶Department of Large Animal Sciences/Veterinary Reproduction and Obstetrics, University of Copenhagen, DK-1958 Frederiksberg C, Denmark

Abstract

Objective and study: Fresh bovine colostrum (BC) prevents development of necrotizing enterocolitis (NEC) in preterm pigs. Spray drying and pasteurization are required to use BC in clinical settings but this may also reduce its bioactivity. In studies on preterm pigs, we compared raw BC with spray dried and pasteurized BC.

Methods: Preterm pigs were fed total parenteral nutrition for 2 d, followed by two boluses of milk formula (15 mL/kg/3h) and continued enteral feeding with milk formula (FORM, n = 14), fresh BC (COLOS, n = 14), spray dried, powdered BC (POW, n = 8), or spray dried, pasteurized BC (POWPAS, n = 9). Pigs were euthanized after two days of enteral feeding and NEC lesions, intestinal structure, digestive and absorptive functions, microbiota, and tissue protein and mRNA levels of immune factors were analyzed. Finally, we determined the concentrations of some bioactive proteins in the colostrum products and studied treatment-related aggregation of proteins.

Results: POW and POWPAS pigs showed lowered gut NEC severity, IL-1 β and IL-8 levels and lactic acid levels, and higher intestinal villus heights, hexose absorption, hydrolase activities (lactase, maltase, peptidases) than FORM pigs (all $P < 0.05$). These values in POW and POWPAS groups were similar to those in the COLOS group. Intestinal expression of *IL1B*, *IL6* and *IL8* and bacterial abundance score were positively correlated with NEC severity ($P < 0.05$). Spray drying, and especially pasteurization, increased the breakdown of growth factors (TGF- β 1 and - β 2) and aggregation of milk proteins.

Conclusion: Spray drying and pasteurization affect BC proteins but such treatments do not necessarily decrease its trophic and anti-inflammatory effects on the immature intestine. It remains to be studied if such colostrum products also improve gut maturation in preterm infants.